Measures 101: A Deep Dive

CHCANYS Clinical Committee

April 1st, 2016

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CHCANYS CPCI CENTER FOR PRIMARY CARE INFORMATICS

Introductions

Eric Gunther

- Engineering team lead
- With company since 2011
- Built measure calculation infrastructure
- Oversee development of new measures and features in CPCI

Samuel Bar

- Implementation Specialist at Azara since 2014
- Managed new implementations and remapping projects at 12 CHCANYS centers
- Mapped data elements for UDS, MU, HEDIS, eHIVQUAL, and P4C
- Familiar with data entry workflows in NextGen, eClinical Works, GE Centricity, Allscripts, and Epic

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Start with a Question

How are we doing when it comes to depression screening and follow-up for patients who screened positive?

- Need to be more specific.
- Ambiguity is one of the main reasons a measure doesn't meet your expectations or doesn't match across systems.
- Be on the lookout for ambiguity!

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Choose a Spec

- **Meaningful Use eCQMs**
  - Published by CMS once a year
  - Extremely specific but high learning curve
  - What we're going to be looking at today
- UDS
  - Published by HRSA once a year
  - FQHC's know it well
  - Fairly accessible specification
- HEDIS
  - Published by NCQA once a year
  - Requires a license
  - Historically made for claims data

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Meaningful Use eCQM Spec

Population criteria

- **Initial Patient Population** =
  - AND: "Patient Characteristic Birthdate: birth date" >= 12 year(s) starts before start of "Measurement Period"
  - AND: "Occurrence A of Encounter, Performed: Depression Screening Denominator Encounter Codes New" during "Measurement Period"
- **Denominator** =
  - AND: "Initial Patient Population"
- **Denominator Exclusions** =
  - AND:
    - OR:
      - AND: MOST RECENT:"Occurrence A of Risk Category Assessment: Adolescent Depression Screening (result: 'Depression Screening Result')" during "Measurement Period"
      - AND NOT: "Occurrence A of Diagnosis, Active: Depression diagnosis" ends before start of "Occurrence A of Risk Category Assessment: Adolescent Depression Screening (result: 'Depression Screening Result')"
      - AND: "Occurrence A of Diagnosis, Active: Depression diagnosis" starts before start of "Occurrence A of Risk Category Assessment: Adolescent Depression Screening (result: 'Depression Screening Result')"
    - OR:
      - AND: MOST RECENT:"Occurrence A of Risk Category Assessment: Adult Depression Screening (result: 'Depression Screening Result')" during "Measurement Period"
      - AND NOT: "Occurrence A of Diagnosis, Active: Depression diagnosis" ends before start of "Occurrence A of Risk Category Assessment: Adult Depression Screening (result: 'Depression Screening Result')"
      - AND: "Occurrence A of Diagnosis, Active: Depression diagnosis" starts before start of "Occurrence A of Risk Category Assessment: Adult Depression Screening (result: 'Depression Screening Result')"
    - OR:
      - AND: MOST RECENT:"Occurrence A of Risk Category Assessment: Adolescent Depression Screening (result: 'Depression Screening Result')" during "Measurement Period"
      - AND NOT: "Occurrence A of Diagnosis, Active: Bipolar Diagnosis" ends before start of "Occurrence A of Risk Category Assessment: Adolescent Depression Screening (result: 'Depression Screening Result')"
      - AND: "Occurrence A of Diagnosis, Active: Bipolar Diagnosis" starts before start of "Occurrence A of Risk Category Assessment: Adolescent Depression Screening (result: 'Depression Screening Result')"
    - OR:
      - AND: MOST RECENT:"Occurrence A of Risk Category Assessment: Adult Depression Screening (result: 'Depression Screening Result')" during "Measurement Period"
      - AND NOT: "Occurrence A of Diagnosis, Active: Bipolar Diagnosis" ends before start of "Occurrence A of Risk Category Assessment: Adult Depression Screening (result: 'Depression Screening Result')"
      - AND: "Occurrence A of Diagnosis, Active: Bipolar Diagnosis" starts before start of "Occurrence A of Risk Category Assessment: Adult Depression Screening (result: 'Depression Screening Result')"
- **Numerator** =
  - AND:
    - OR:
      - AND: MOST RECENT:"Occurrence A of Risk Category Assessment: Adolescent Depression Screening (result: 'Depression Screening Result')" during "Measurement Period"
      - AND: "Patient Characteristic Birthdate: birth date" < 18 year(s) starts before start of "Occurrence A of Risk Category Assessment: Adolescent Depression Screening (result: 'Depression Screening Result')"
      - AND:
        - OR: "Occurrence A of Risk Category Assessment: Adolescent Depression Screening (result: 'Negative Depression Screening')" during "Measurement Period"
        - OR:
          - AND: "Occurrence A of Risk Category Assessment: Adolescent Depression Screening (result: 'Positive Depression Screening')" during "Measurement Period"
          - AND:
            - OR: "Intervention, Performed: Additional evaluation for depression - adolescent"
            - OR: "Intervention, Order: Referral for Depression Adolescent"
            - OR: "Medication, Order: Depression medications - adolescent"
            - OR: "Intervention, Performed: Follow-up for depression - adolescent"
            - OR: "Procedure, Performed: Suicide Risk Assessment"
            - <= 1 day(s) starts after start of "Occurrence A of Risk Category Assessment: Adolescent Depression Screening (result: 'Positive Depression Screening')"
    - OR:
      - AND: MOST RECENT:"Occurrence A of Risk Category Assessment: Adult Depression Screening (result: 'Depression Screening Result')" during "Measurement Period"
      - AND: "Patient Characteristic Birthdate: birth date" >= 18 year(s) starts before start of "Occurrence A of Risk Category Assessment: Adult Depression Screening (result: 'Depression Screening Result')"
      - AND:
        - OR: "Occurrence A of Risk Category Assessment: Adult Depression Screening (result: 'Negative Depression Screening')" during "Measurement Period"
        - OR:
          - AND: "Occurrence A of Risk Category Assessment: Adult Depression Screening (result: 'Positive Depression Screening')" during "Measurement Period"
          - AND:
            - OR: "Intervention, Performed: Additional evaluation for depression - adult"
            - OR: "Intervention, Order: Referral for Depression Adult"
            - OR: "Medication, Order: Depression medications - adult"
            - OR: "Intervention, Performed: Follow-up for depression - adult"
            - OR: "Procedure, Performed: Suicide Risk Assessment"
            - <= 1 day(s) starts after start of "Occurrence A of Risk Category Assessment: Adult Depression Screening (result: 'Positive Depression Screening')"
- **Denominator Exceptions** =
  - AND:
    - OR: "Risk Category Assessment not done: Medical reason contraindicated" for "Adolescent Depression Screening LOINC Value Set"
    - OR: "Risk Category Assessment not done: Medical reason contraindicated" for "Adult Depression Screening LOINC Value Set"
    - OR: "Risk Category Assessment not done: Patient Reason refused" for "Adolescent Depression Screening LOINC Value Set"
    - OR: "Risk Category Assessment not done: Patient Reason refused" for "Adult Depression Screening LOINC Value Set"
    - during "Measurement Period"

Data criteria (QDM Data Elements)

- "Diagnosis, Active: Bipolar Diagnosis" using "Bipolar Diagnosis Grouping Value Set (2.16.840.1.113883.3.600.450)"
- "Diagnosis, Active: Depression diagnosis" using "Depression diagnosis Grouping Value Set (2.16.840.1.113883.3.600.145)"
- "Encounter, Performed: Depression Screening Denominator Encounter Codes New" using "Depression Screening Denominator Encounter Codes New Grouping Value Set (2.16.840.1.113883.3.600.1916)"
- "Intervention, Order: Referral for Depression Adolescent" using "Referral for Depression Adolescent SNOMED-CT Value Set (2.16.840.1.113883.3.600.537)"
- "Intervention, Order: Referral for Depression Adult" using "Referral for Depression Adult SNOMED-CT Value Set (2.16.840.1.113883.3.600.538)"
- "Intervention, Performed: Additional evaluation for depression - adolescent" using "Additional evaluation for depression - adolescent SNOMED-CT Value Set (2.16.840.1.113883.3.600.1542)"

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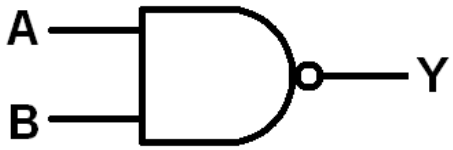
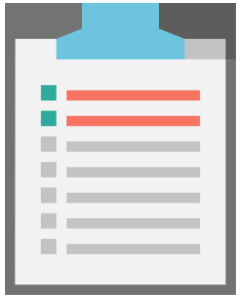
Anatomy of a Measure

- Measure logic
  - The ANDs and ORs



- Value sets
  - Defining data elements
  - Lists of codes



- Attribution
  - Running a measure by provider or location
  - Running a measure for a month or quarter
  - Putting patients into buckets

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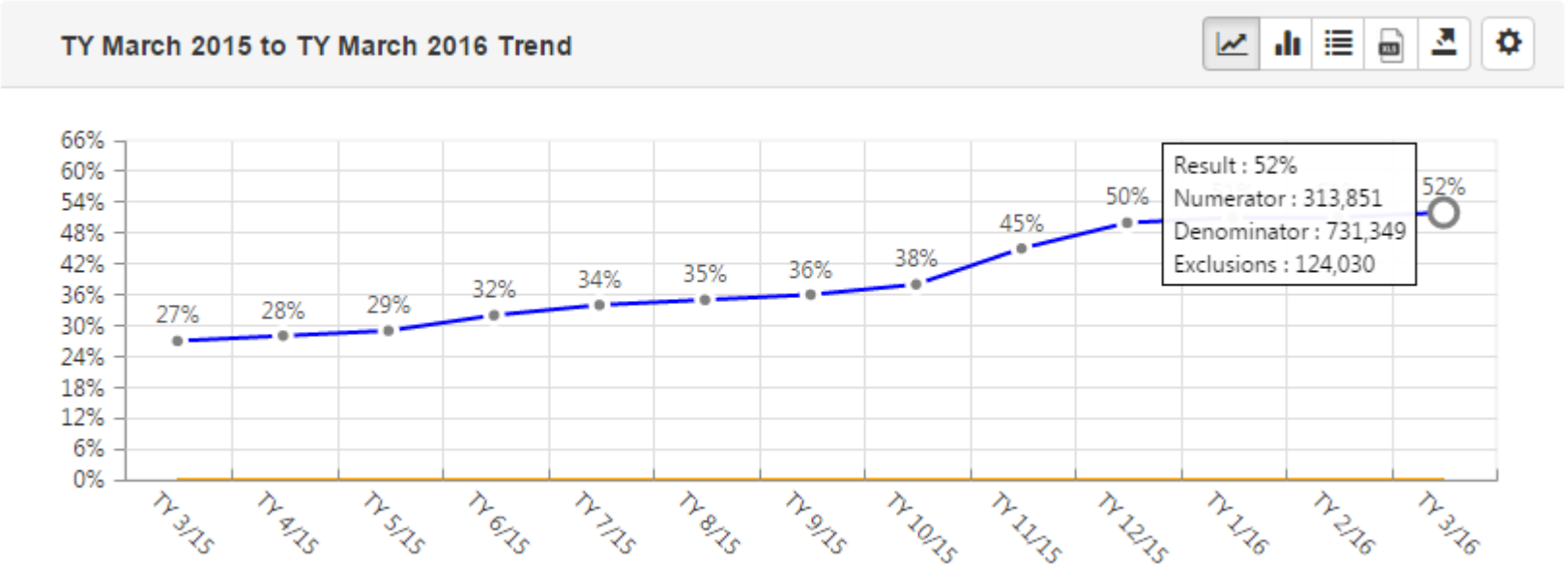
Measure Logic – Calculating the Result

$$\text{Measure result} = \frac{\text{Numerator}}{\text{Denominator - Exclusions}}$$



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Measure Logic – Denominator Population

Start with the denominator

Patients who had ...

- A qualifying visit in the past year
  - **AND**
- Over 12 years old
  - Ambiguous!
  - How about “age at beginning of reporting period >= 12 years”

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Measure Logic – Numerator Population

Patients in the denominator who had...

- A negative result in their *most recent* depression screen
  - **OR**
- A positive result in their most recent depression screen **AND** follow-up documented

- Ambiguous!
  - What counts as a positive depression screen?
  - What counts as follow-up?
  - When does the follow-up have to be documented?

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Measure Logic – Numerator Population Clarified

- What is a positive depression screen?
  - PHQ-2 >= 3
  - PHQ-9 >= 10
  - Other standardized depression screen marked as positive
- What is follow-up?
  - Depression medications
  - Additional evaluation for depression
  - Referral for depression
  - Can be custom mapped for your health center
- When does follow-up have to be documented?
  - MU – within a day
  - UDS – before the end of the year

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Measure Logic – Exclusions Population

Patients in the denominator who had...

- Active depression **OR** bipolar diagnosis

See any problems with this?

Excluding people who got screened, had follow-up, and were subsequently diagnosed. Those were all numerator patients!

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Measure Logic – Exclusions Population Fixed

Patients in the denominator who had...

- Active depression or bipolar diagnosis **AND** (no screen during reporting period **OR** the diagnosis was made before the screen)

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Measure Logic – "Exclusion" Confusion

Patients not in the denominator population (UDS)

Numerator	Denominator	Result
75	100	75%

75/100 = 75%

Patients reported in the exclusions population (MU)

Numerator	Denominator	Exclusions	Result
75	120	20	75%

75/(120-20) = 75%

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Value Sets

- Lists of codes defining the data elements
- Code systems
  - CPT – procedures, office visits
  - ICD-9/10 – diagnoses
  - RxNorm – medications
  - Custom mappings
    - Takes a lot of effort compared to codified data
- Try to use standardized value sets
- Value set feedback process
  - Submit tickets through ONC's JIRA to question value set content
  - Medications example – should Abilify be in the value set?

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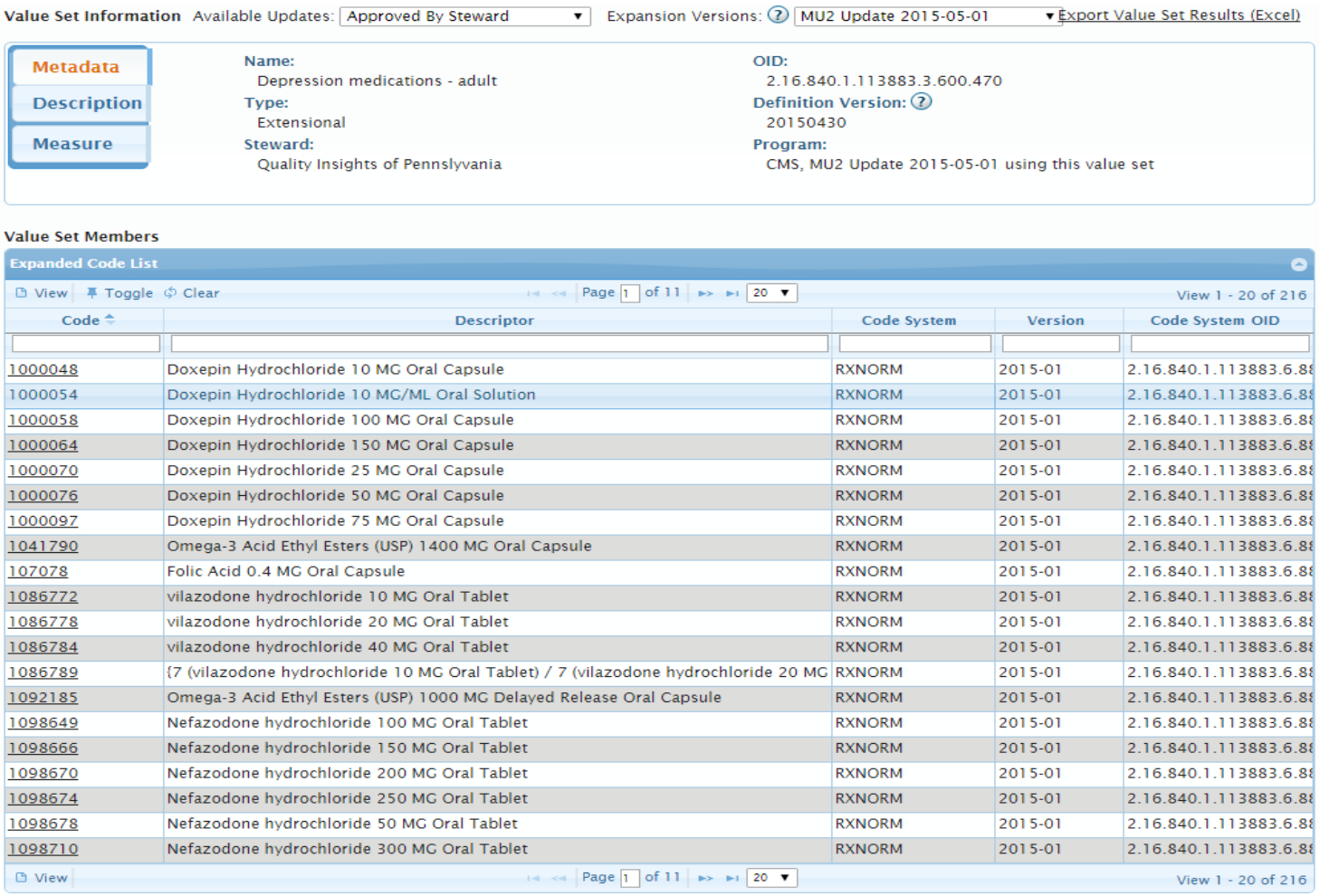
Value Sets - Example

Depression medication value set from VSAC (Value Set Authority Center)



Value Set Information Available Updates: Approved By Steward ▾ Expansion Versions: MU2 Update 2015-05-01 ▾ Export Value Set Results (Excel)

Metadata | Description | Measure

Name: Depression medications - adult
OID: 2.16.840.1.113883.3.600.470
Type: Extensional
Definition Version: 20150430
Steward: Quality Insights of Pennslyvania
Program: CMS, MU2 Update 2015-05-01 using this value set

Value Set Members

Expanded Code List

View | Toggle | Clear — Page 1 of 11 — 20 — View 1 - 20 of 216

Code	Descriptor	Code System	Version	Code System OID
1000048	Doxepin Hydrochloride 10 MG Oral Capsule	RXNORM	2015-01	2.16.840.1.113883.6.88
1000054	Doxepin Hydrochloride 10 MG/ML Oral Solution	RXNORM	2015-01	2.16.840.1.113883.6.88
1000058	Doxepin Hydrochloride 100 MG Oral Capsule	RXNORM	2015-01	2.16.840.1.113883.6.88
1000064	Doxepin Hydrochloride 150 MG Oral Capsule	RXNORM	2015-01	2.16.840.1.113883.6.88
1000070	Doxepin Hydrochloride 25 MG Oral Capsule	RXNORM	2015-01	2.16.840.1.113883.6.88
1000076	Doxepin Hydrochloride 50 MG Oral Capsule	RXNORM	2015-01	2.16.840.1.113883.6.88
1000097	Doxepin Hydrochloride 75 MG Oral Capsule	RXNORM	2015-01	2.16.840.1.113883.6.88
1041790	Omega-3 Acid Ethyl Esters (USP) 1400 MG Oral Capsule	RXNORM	2015-01	2.16.840.1.113883.6.88
107078	Folic Acid 0.4 MG Oral Capsule	RXNORM	2015-01	2.16.840.1.113883.6.88
1086772	vilazodone hydrochloride 10 MG Oral Tablet	RXNORM	2015-01	2.16.840.1.113883.6.88
1086778	vilazodone hydrochloride 20 MG Oral Tablet	RXNORM	2015-01	2.16.840.1.113883.6.88
1086784	vilazodone hydrochloride 40 MG Oral Tablet	RXNORM	2015-01	2.16.840.1.113883.6.88
1086789	{7 (vilazodone hydrochloride 10 MG Oral Tablet) / 7 (vilazodone hydrochloride 20 MG	RXNORM	2015-01	2.16.840.1.113883.6.88
1092185	Omega-3 Acid Ethyl Esters (USP) 1000 MG Delayed Release Oral Capsule	RXNORM	2015-01	2.16.840.1.113883.6.88
1098649	Nefazodone hydrochloride 100 MG Oral Tablet	RXNORM	2015-01	2.16.840.1.113883.6.88
1098666	Nefazodone hydrochloride 150 MG Oral Tablet	RXNORM	2015-01	2.16.840.1.113883.6.88
1098670	Nefazodone hydrochloride 200 MG Oral Tablet	RXNORM	2015-01	2.16.840.1.113883.6.88
1098674	Nefazodone hydrochloride 250 MG Oral Tablet	RXNORM	2015-01	2.16.840.1.113883.6.88
1098678	Nefazodone hydrochloride 50 MG Oral Tablet	RXNORM	2015-01	2.16.840.1.113883.6.88
1098710	Nefazodone hydrochloride 300 MG Oral Tablet	RXNORM	2015-01	2.16.840.1.113883.6.88

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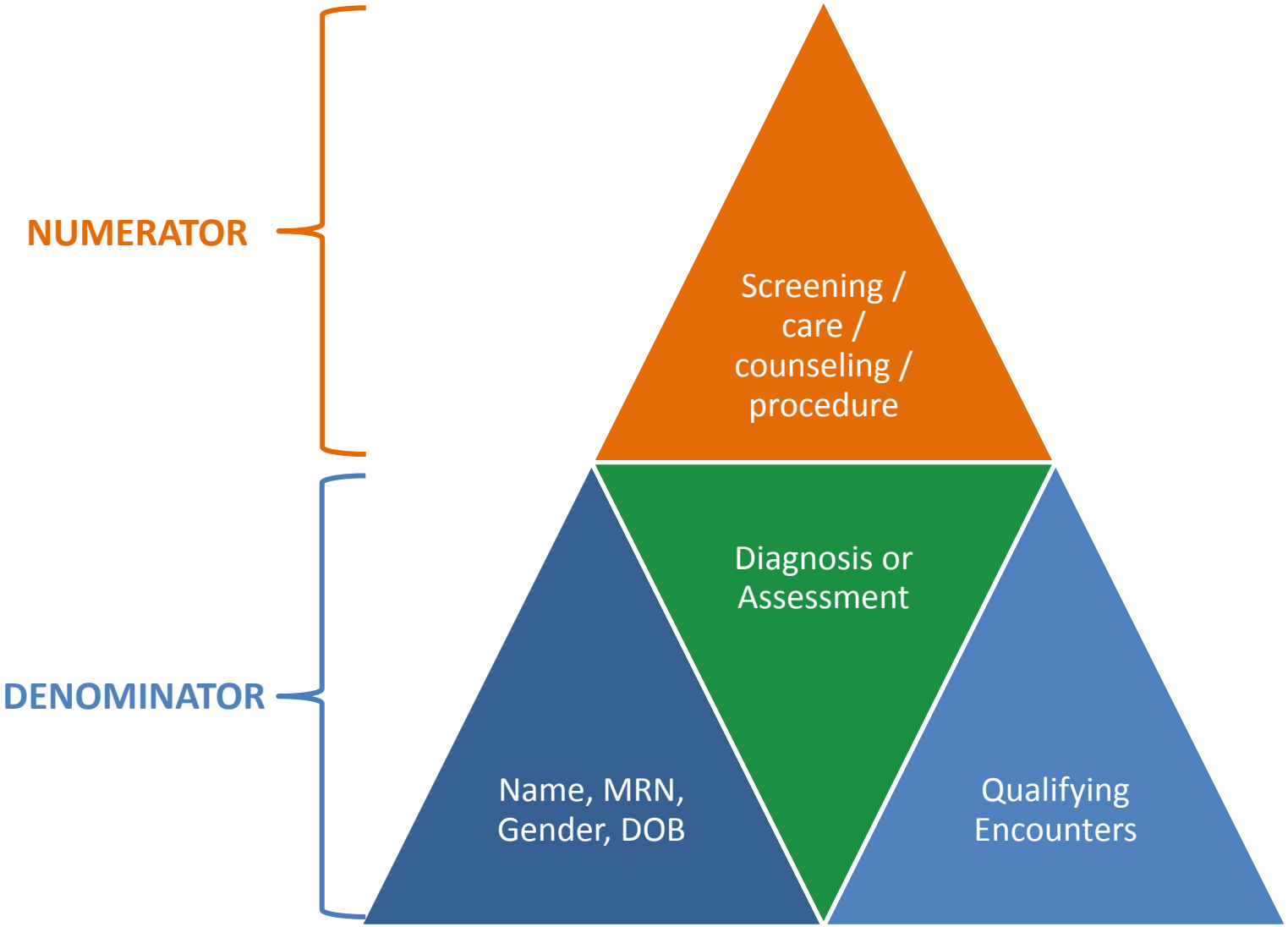
Data Elements are the Building Blocks of Measures



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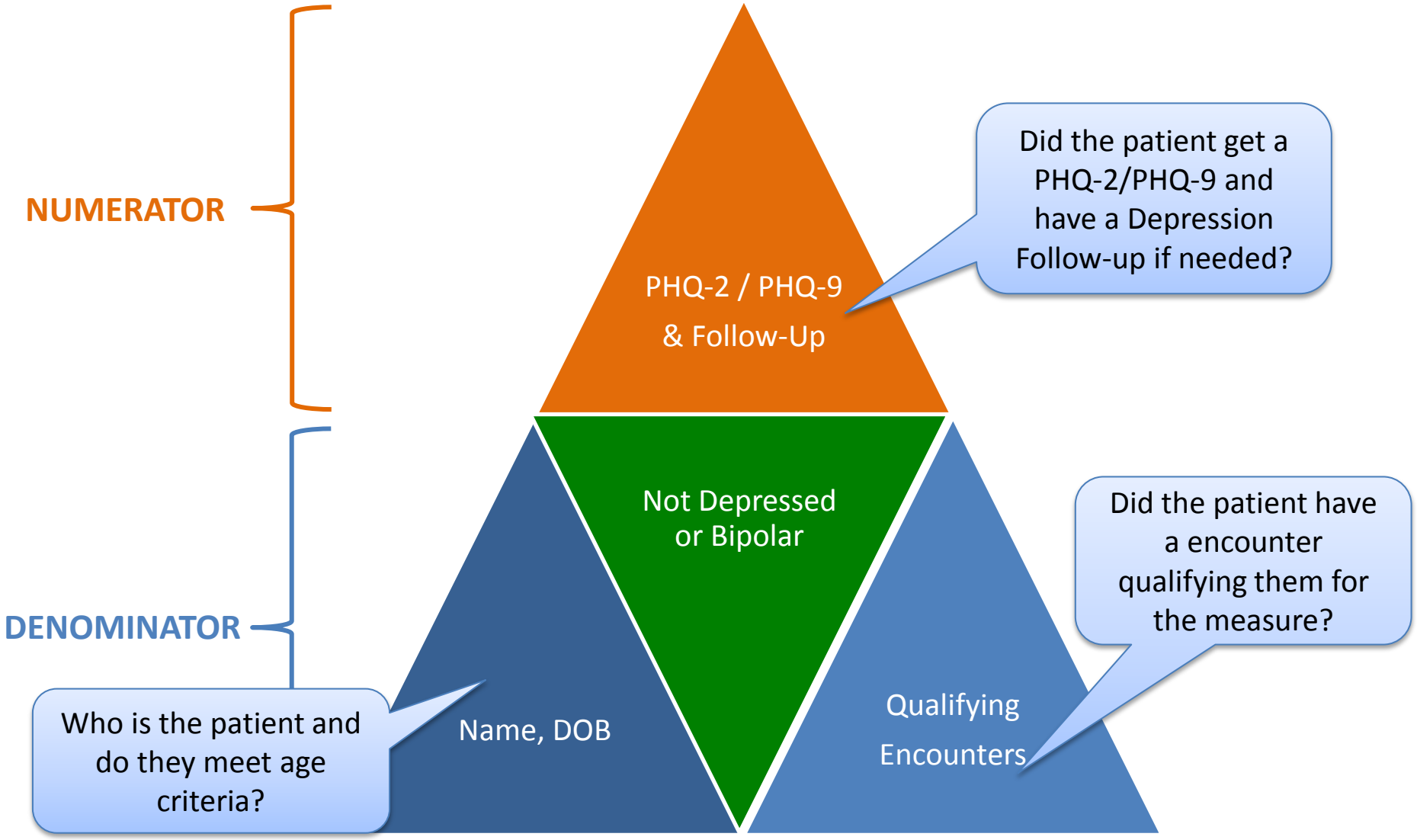
Depression Screening Data Elements



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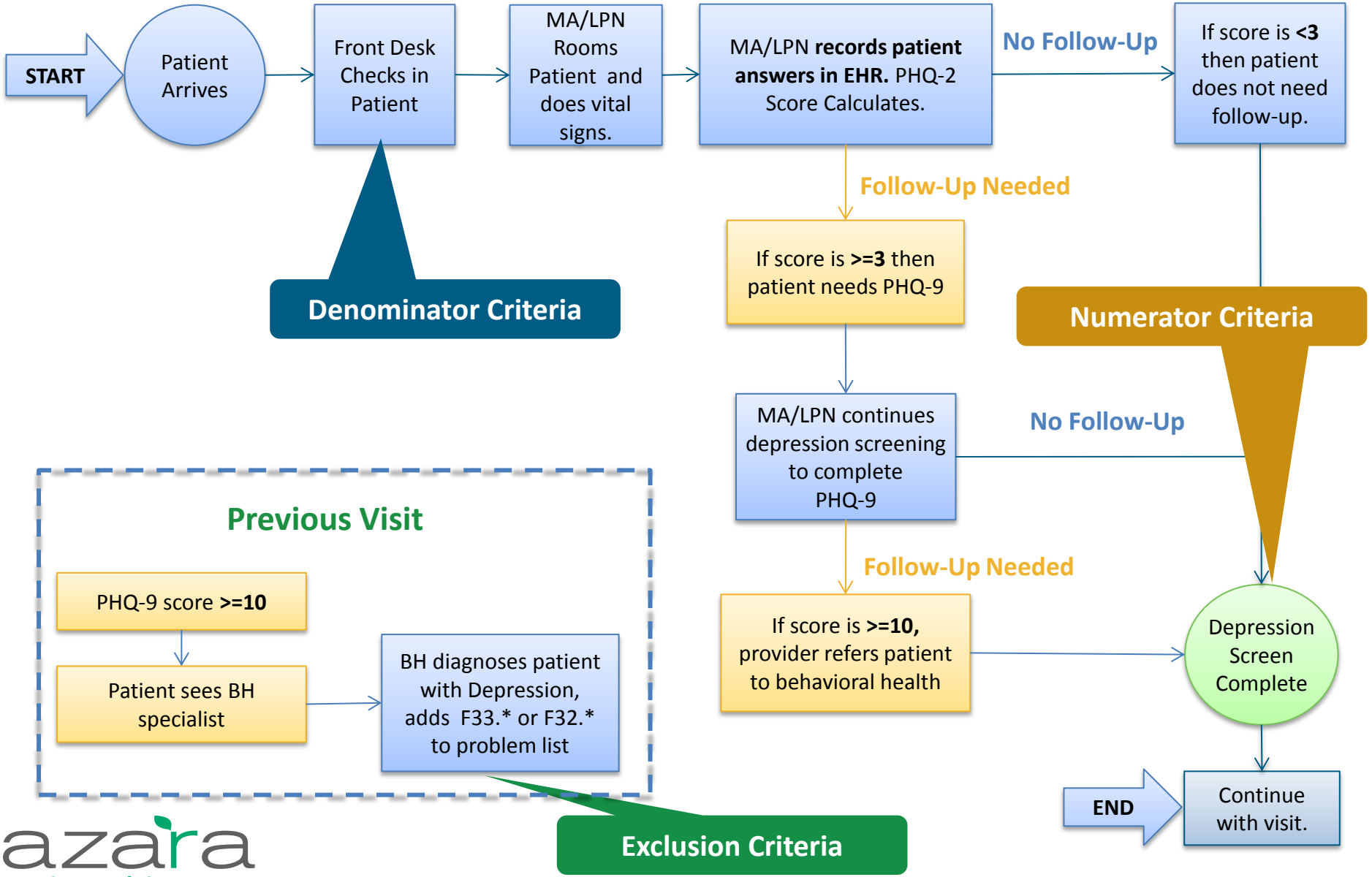
Depression Screening and Follow-Up



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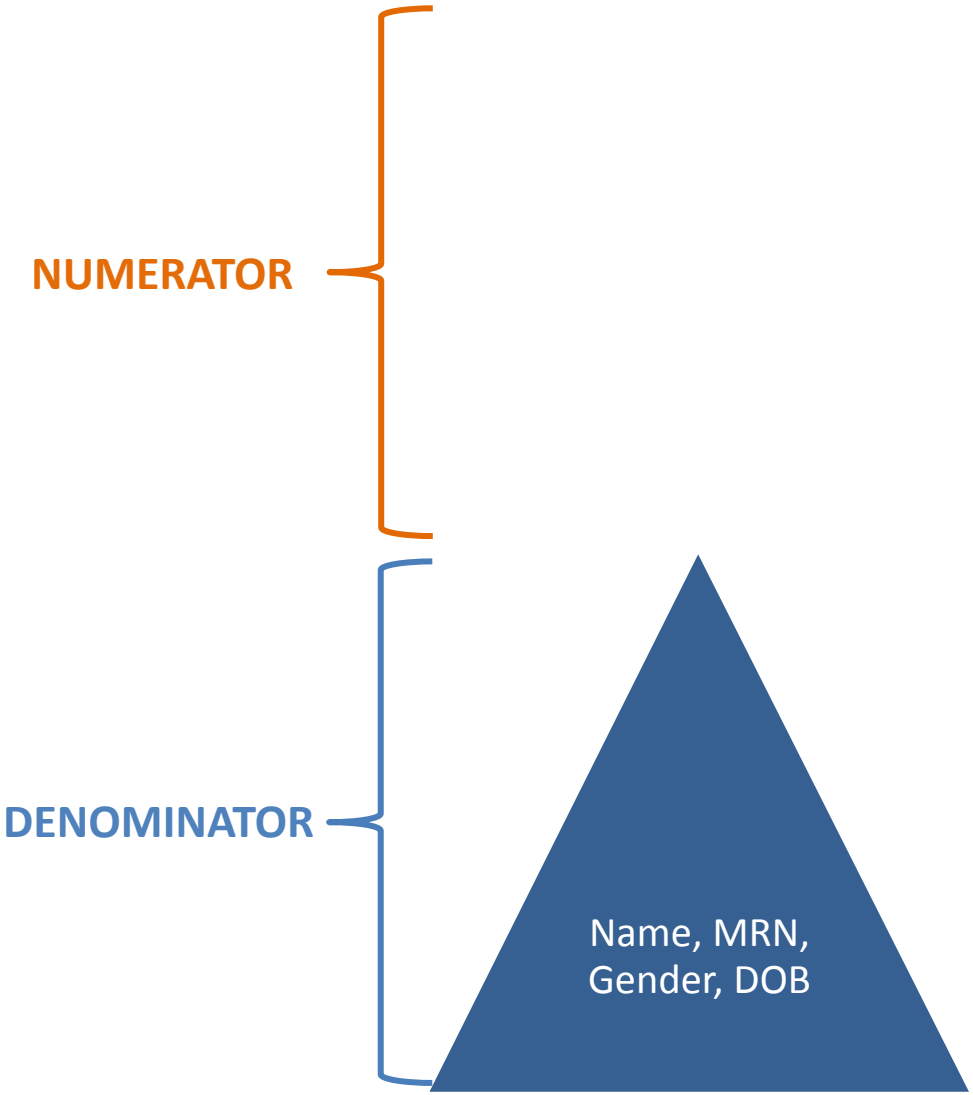
Missing Data



PHQ-2 done by patient on **paper**, never in EHR

Free text Comments: Patient is depressed

Patient is billed with custom CPT codes

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Missing data elements are like holes in a foundation.

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Common Mapping Issues

Denominator

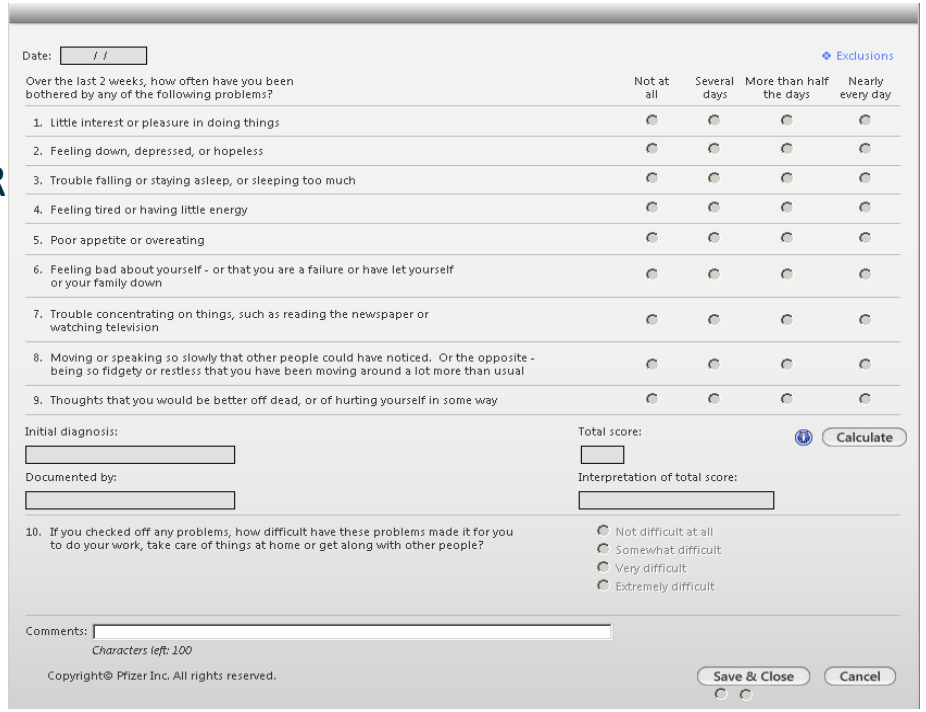
- Use of custom CPT codes, addition of modifiers

Numerator

- Depression screening done outside EHR
- Unstructured PHQ-2 & PHQ-9 results
- No clear follow-up workflow
- Medications dispensed without structured data

Exclusions

- Behavioral Health does not use EHR
- Depression diagnosis not entered using correct ICD9/ICD10/SNOMED



Date: / /

Exclusions

Over the last 2 weeks, how often have you been bothered by any of the following problems?	Not at all	Several days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things				
2. Feeling down, depressed, or hopeless				
3. Trouble falling or staying asleep, or sleeping too much				
4. Feeling tired or having little energy				
5. Poor appetite or overeating				
6. Feeling bad about yourself - or that you are a failure or have let yourself or your family down				
7. Trouble concentrating on things, such as reading the newspaper or watching television				
8. Moving or speaking so slowly that other people could have noticed. Or the opposite - being so fidgety or restless that you have been moving around a lot more than usual				
9. Thoughts that you would be better off dead, or of hurting yourself in some way				

Initial diagnosis:

Total score: Calculate

Documented by:

Interpretation of total score:

10. If you checked off any problems, how difficult have these problems made it for you to do your work, take care of things at home or get along with other people?

- Not difficult at all
- Somewhat difficult
- Very difficult
- Extremely difficult

Comments:

Characters left: 100

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Save & Close Cancel

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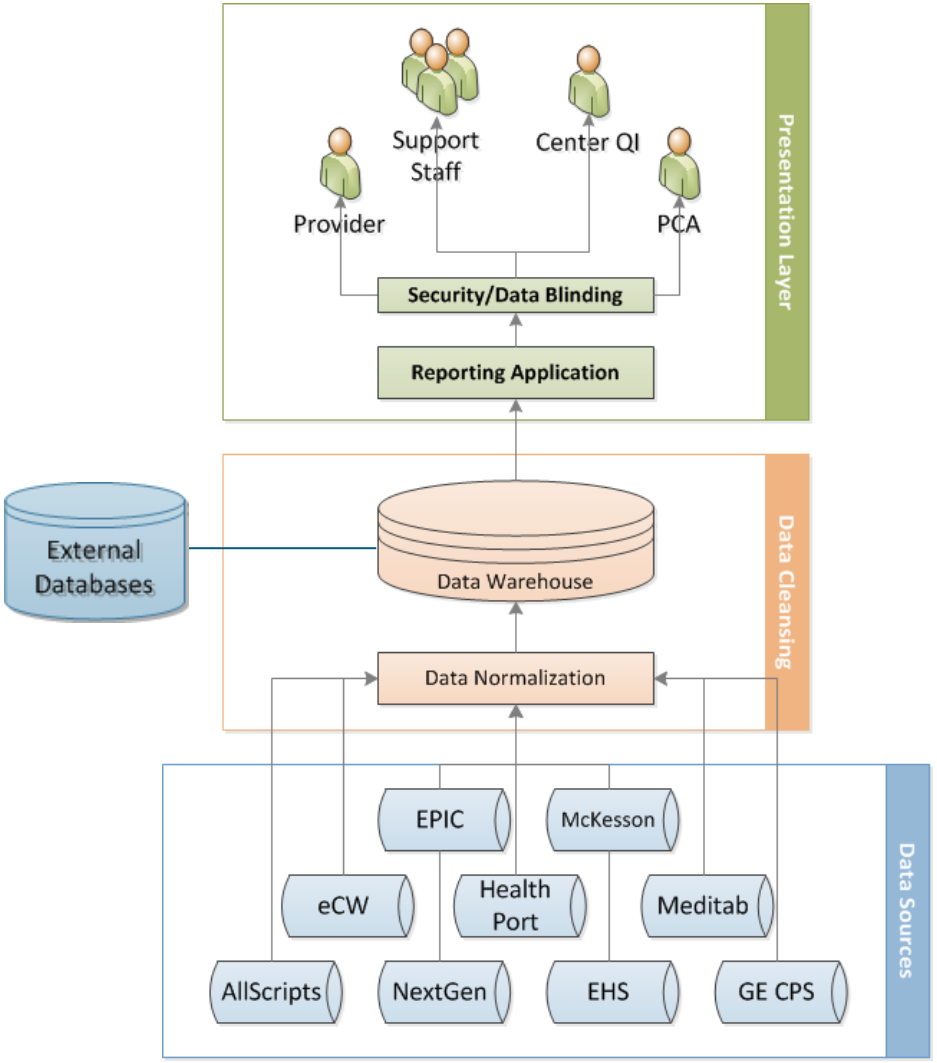
CPCI Architectural Overview

- PCA and PCMH focused solution
- Data from disparate EHR and EPM systems
- Daily data refresh
- Data unified in EHR-agnostic Data Warehouse for apples to apples comparison
- Web-based reporting platform accessible from any major browser
- User role differentiation and data blinding
- Graphical and text based depictions of datasets
- External data links geographic characteristics to patients & providers



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CPCI Data Processing

- Loading (ETL)
  - Nightly
  - Normalization and “scrubbing”
- Measure calculation
  - Weekly
  - All patients, all measures, “current” periods
  - Historical processing upon request
- Attribution
  - Run-time (when you use a report)
  - Aggregate measure results

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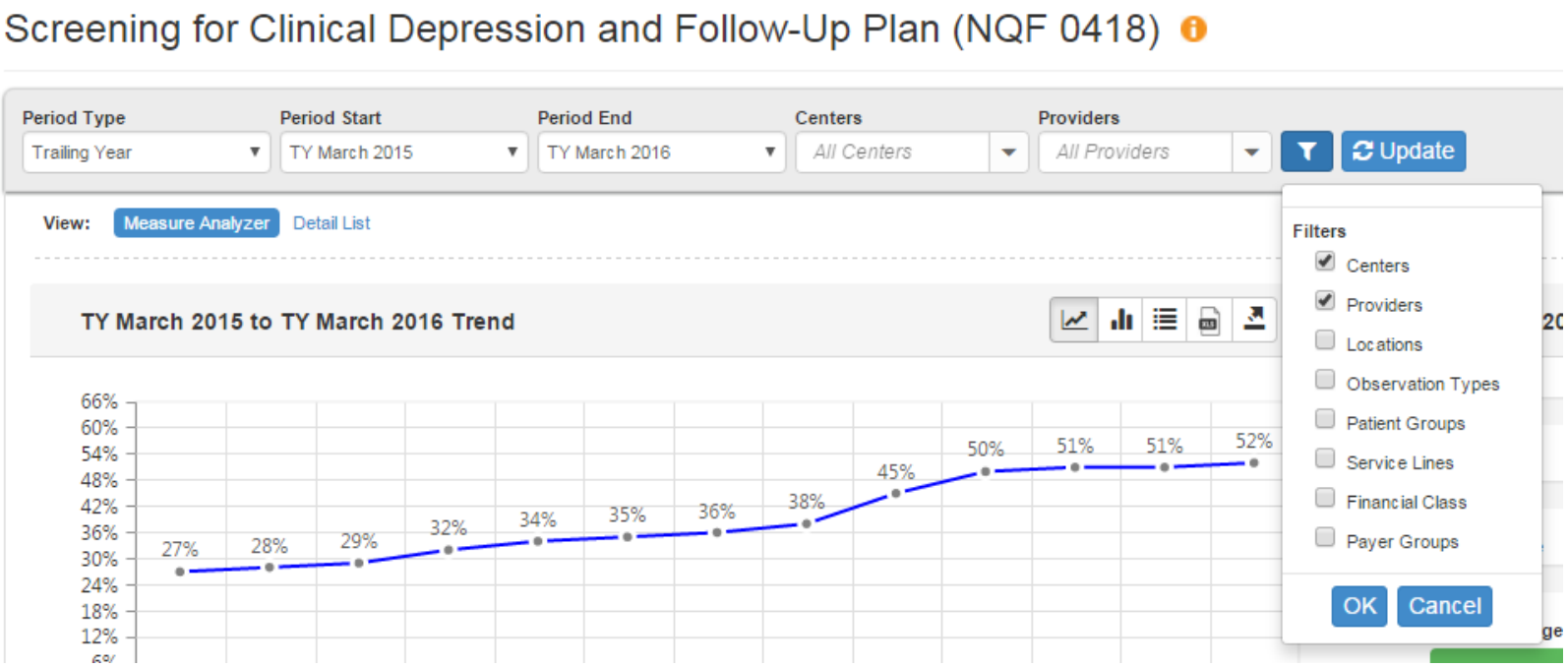
Attribution

- “Slicing and dicing” the measures
- Measures are calculated per patient, attribution is how we sum up the measure results by placing patients into buckets



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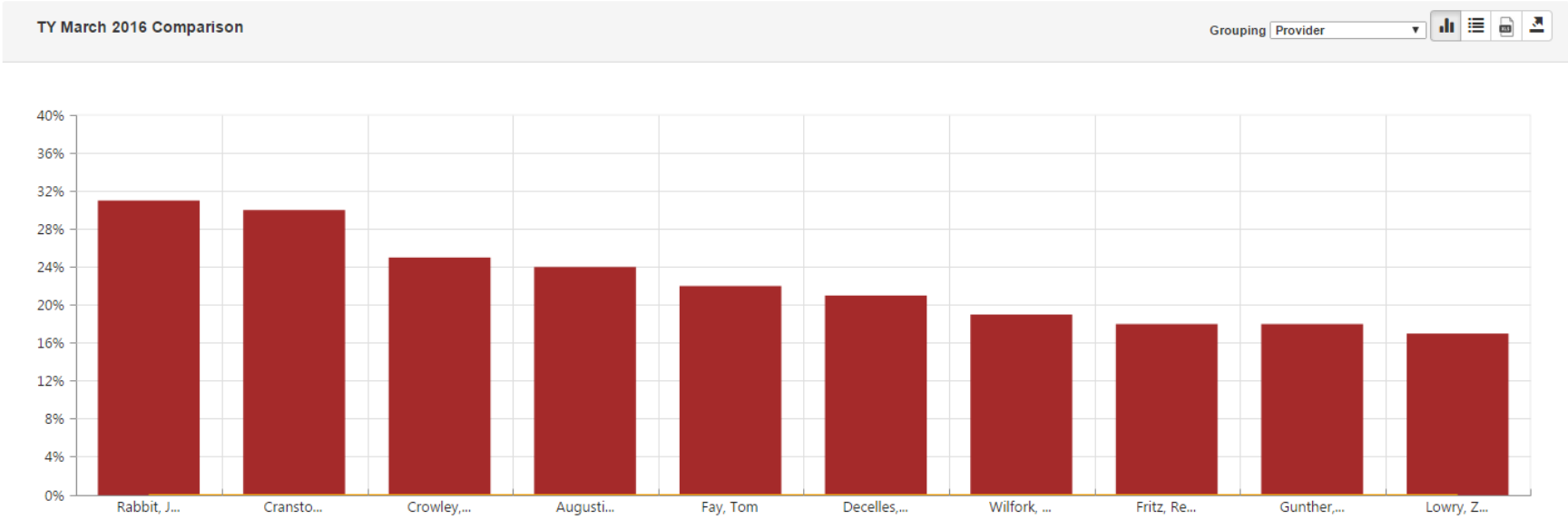
Attribution - Provider

- Sum up patient results into provider buckets
  - Rendering provider – patient had to have a visit with the provider
    - Patients can contribute to multiple buckets, you can't add up all the buckets to get your center's total
  - Usual provider – patient must be in the provider's panel



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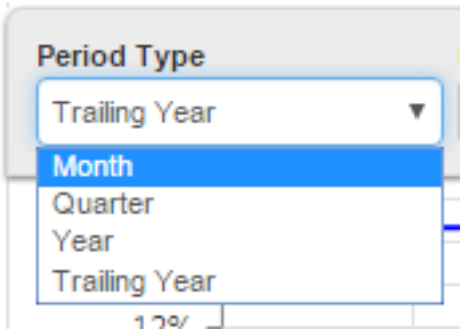
Attribution - Period

- Most measure specs assume a year long period, so how can we run them for smaller periods like month or quarter?
- Running a measure for “March 2016”
  - Uses Trailing Year (TY) March 2016 measure results
  - Only return patients who had a visit in March 2016
- Why not just calculate measure for smaller period?
  - Don’t want to change compliance standard. Requiring depression screen in the past month, as opposed to past year, would bring down the numerator.
  - The drilldown becomes meaningless!



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Attribution – Choosing a Period

- Trailing Year / Calendar Year
  - Most compliance reporting is trailing year
  - If we had to report this month, what is our result?
- Month/Quarter
  - Better for tracking progression and monitoring PDSA cycle
  - How did we do this month?

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Additional Resources

- CMS eCQM Library
  - https://www.cms.gov/regulations-and-guidance/legislation/ehrincentiveprograms/ecqm_library.html
- UDS 2015 manual
  - http://bphc.hrsa.gov/datareporting/reporting/2015udsmanual.pdf
- Value Set Authority Center (VSAC)
  - https://vsac.nlm.nih.gov/
  - Requires free UMLS license
- USHIK (great display of measure logic & value sets)
  - https://ushik.ahrq.gov/mdr/portals/mu?system=mu&enableAsynchronousLoading=true
- eCQI Resource Center
  - https://ecqi.healthit.gov/
- eCQM Issue Tracking
  - https://jira.oncprojectracking.org

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Questions

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